

# Analysis of Cloud Services

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**Abstract** - Cloud computing is becoming a major driver of innovation in various fields of technology as the cloud offers a lot of benefits for a very small cost. This paper does a comprehensive analysis of various terminologies related to cloud computing. Cloud computing being a relatively new technology is confusing to many users. This paper aims to simple it down so that everyone finds it easy to understand.

**Key Words:** Cloud Computing, Hybrid Cloud, Infrastructure as a service, Platform as a service, Private cloud, Public cloud, Software as a service

## 1. INTRODUCTION

Cloud computing is the delivery of computing services — servers, databases, storage, networking, software, analytics and more — over the Internet. Cloud computing provides shared computer processing resources and data to computers and other devices on demand. Cloud services are becoming very popular in today's world because of the high cost savings associated with it. Cloud computing has the power to transform the way businesses run by eliminating the need of traditional data centers.

## 2. Benefits of cloud computing

### 2.1 Cost

Buying of high end servers and storing them in data centers have a very high cost associated with it. Cloud computing eliminates this very high capital expense of buying hardware and software. Setting up of system and running on-site data centers has a high cost associated with it. Maintenance of the racks of servers and employees required for managing the infrastructure also has to be accounted for. Additionally, there may be a high electricity cost in certain area. These costs can be avoided by shifting the responsibility of managing the data center and its infrastructure to a cloud service provider.

### 2.2 Speed

Cloud computing services are powered by modern high speed & capacity machines. Cloud services are provided on demand and so most servers can be provisioned in minutes with few clicks. This enables most businesses to get started with their

application as soon as possible. Also, this takes care of capacity planning.

### 2.3 Global scale

Cloud services are provided on a global scale. Most cloud service providers own multiple datacenters across the globe. This can help businesses deliver applications faster to geographically near users. This can also provide variability in terms of delivering higher or lower computing power based on the users in that region.

### 2.4 Productivity

Cloud servers are easy to create and use. There is no need for hardware setup, software patching and other time-consuming IT management chores. These tasks are taken care of by the cloud provider. This helps the company to increase productivity by only focusing on tasks that are important.

### 2.5 Performance

Cloud services run on the best hardware and software, these are regularly upgraded to the latest generation of fast and efficient computing hardware. This helps businesses to have the best performance for their applications.

### 2.6 Reliability

To keep the data of users secure, cloud providers regularly do data backups so that no data is lost in case of a disaster event. There are many failover systems that take care of multiple systems going down. Cloud providers also mirror data at multiple redundant sites, this will help in business continuity.

## 2. Types of cloud services: IaaS, PaaS, SaaS

Most cloud computing services fall into three broad categories: infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS).

### 3.1 Infrastructure-as-a-service (IaaS)

In IaaS businesses can rent infrastructure this includes servers, network storage, databases and operating systems. This enables businesses to build upon these technologies and provide their own custom solution to users. This platform

offers highly scalable resources on demand This makes it useful for tasks that are experimental in nature.

### 3.2 Platform-as-a-service (PaaS)

In PaaS the cloud provider offers an environment for building, testing, and managing software applications. This can enable business to manage their application without the complexity of building and maintaining the infrastructure. It is designed to make it easier for developers to create and deploy web and mobile in a quick and efficient manner, without worrying about setting up or managing the underlying infrastructure of servers, network and databases

### 3.3 Software-as-a-service (SaaS)

In SaaS, software or an application is centrally hosted and licensed to users over the internet. Users can take subscriptions to applications that are centrally hosted. The cloud providers manage the underlying infrastructure and handle any maintenance tasks like software and hardware upgrades and security patches. SaaS has become a common delivery model for applications like email, document editing etc. users can purchase a subscription and connect to the application over the internet, usually with a web browser on their phone tablet or pc.

## 4. Types of cloud deployments

There are three different ways of deploying cloud computing resources

### 4.1 Public Cloud

Public clouds are owned and managed by a third-party cloud provider They deliver applications such as servers, storage and networking over the internet. They are usually easy and inexpensive to set up because all server maintenance is covered by the service provider. these types of cloud can also be scaled to fit a particular business requirement you only pay only for what you use to there is no wastage of resources, some businesses might have a concern regarding security of public clouds because there is usually no control over the data. After a server is used, it is usually given to a different customer to use, in this case the data might not have been securely deleted off the system, if the other user has malicious intent, this can cause significant losses to the business. Microsoft Azure and Amazon AWS is an example of public cloud.

### 4.2 Private Cloud

A private cloud is a cloud infrastructure that is owned and managed by a single organization; it is usually hosted within the data center of a particular organization. Hosting a private cloud requires a lot of initial investment and a lot of planning when done correctly it can improve business and have

significant cost advantages. There is the benefit of having fully secured datacenters, with full control over their data center. They do require a lot of employees to manage and run the data centers and may also have high electricity costs and cooling costs associated with it. Although they secure in terms of security, they are criticized for having businesses to still buy, build and manage the servers and do not really benefit from the cloud model. If the resources are not utilized they are not given to anyone else and are left idle.

### 4.3 Hybrid Cloud

A hybrid cloud combines the benefits of both public and private clouds. Hybrid cloud gives businesses great flexibility in terms of deployment and security. Hybrid cloud can also enable interoperability between different cloud providers, so that there is no dependence on a single cloud service. If a certain cloud service goes offline businesses can have more options. Hybrid cloud has benefits of both cost savings on public cloud and security in private cloud. Businesses can switch between these two when they like. a hybrid cloud setup can eliminate the need for a company to make massive investments to handle short term spikes in demand. The company only pays for the resources it consumes on the public cloud.

## 5. Types of Cloud Services

### 5.1 Cloud Compute

Cloud compute offers dedicated virtual machines running in managed datacenters. these servers are owned and managed by the cloud provider. These virtual machines are upgraded with the latest hardware and software patches These VMs are usually configured to be quick to setup and boot. They usually come in predefined types or can be custom configured built for the user's specific needs. These VMs can be horizontally scaled by adding more number of servers for the particular application or can be vertically scaled by increasing the amount of disk space and RAM to a particular machine. There is also an option to increase the amount of VMs if there is a high amount of traffic, and automatically decrease the VMs when there is less traffic coming to the application, multiple VMs can also be clubbed together to create a cluster that can be orchestrated together to take advantage of multiple scaling options cloud computing also has dynamic pricing based on the amount of resources you use. you are only charged for the resources you utilize and for the period you utilize them for. there are also various pricing options such as if you commit to use a particular instance for a particular amount of years, you will get a better rate. there are also sustained use discounts, if you use the VMs continuously for a period of time you can have certain discounts. this enables businesses to have the utmost flexibility in running their application. This service can also be deployed in IaaS or PaaS. If you choose IaaS then you have to manage the configurations of your VMs to run your application. in a PaaS

you have a preconfigured environment that you just upload your application; you don't have to worry about configuration and managing the environment

## 5.2 Cloud Storage

Cloud Storage is storage that is provided in the cloud. it is used to store documents or backups. cloud storage is typically more reliable, secure and scalable than on-premises storage systems. cloud providers provide high speed storage that is mirrored across locations so in event of a disaster customer data is not lost. cloud storage is digital data that is stored in logical pools and the physical storage span multiple servers, cloud provider are responsible for keeping the data available and accessible at all times. This is done by replicating the data at multiple locations. cloud storage can be of many types such as highly available, consistent, low-latency, scalable storage. Cloud storage can be used to store variety of files such as documents, backups or databases.

## 5.3 Cloud Databases

Cloud databases are fully managed database service that makes it easy to set up maintain, manage and administer your databases in the cloud. Cloud database can support a variety of relational (such as Oracle, MySQL, IBM DB2 etc.) and non-relational databases (such as MongoDB, CouchDB etc.). These databases are managed automatically by software. They are built to work under heavy read/write loads and can scale up and down easily.

## 5.4 Cloud Networking

Third party cloud providers usually have the best networking capabilities and with the help of cloud many small businesses can take advantage of the superior networking capabilities. These networks are usually closest to the customers ensuring high speed for the application. These ensure that the customers get data with the lowest latency. Networking can help businesses to isolate their cloud infrastructure, connect their physical network to a private virtual network. Cloud networking are also used to auto scale applications across the globe in various regions. This will help serving data fastest to users in locations with very high demand. Cloud networking also provides DNS services that can map domain names into IP addresses. High speed content delivery networks are located in EDGE caches across the globe. This helps applications to serve content fast.

## 6. Conclusion

The Paper has been written in such a way that it explains the concepts and various types of cloud computing. The paper is the benefits of cloud computing as well as different types of cloud infrastructure. This paper also mentions the different ways we can do cloud deployments as well as the services provided by major cloud companies

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